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Beyond narrative: Is there an implicit structure to the way in which adults organise their discourse?

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Abstract

Understanding the structure of discourse in healthy adults is fundamental to the diagnosis of discourse level impairments in clinical populations and the development of effective treatment regimes. Exploring discourse genres in healthy speakers that extend beyond the traditional narrative is equally paramount in facilitating maximum impact of clinical interventions in everyday speaking contexts. This study aimed to characterise the discourse of 30 healthy adult speakers across three age groups (20-39, 40-59, 60+ years) and four discourse genre (recount, procedural, exposition and narrative), drawing on novel discourse frameworks used in classroom teaching. A discourse protocol and analytic procedure using SALT was developed that profiled the macrostructure of the different genres, exploring coherence and cohesion within and across genre in a systematic manner. Analysis considered whether there were differences in coherence and cohesion between the different age groups, different genres and specific topics. Results showed that, while individual variability was present, healthy adults structured their discourse consistently, adhering to the developmental frameworks, across all four genres. Significant age differences were only seen in the amount of information contained in the body of the discourse (i.e. events, steps or statements offered) with older participants offering less information. This dataset will enable comparisons to be drawn with clinical populations to determine the utility of this framework for diagnosis and intervention.

Keywords: discourse genres, normal discourse, age differences, macrostructure

Introduction

Examining the discourse of people from clinical populations has been of interest for close on four decades, with studies spanning aphasia (e.g. Ulatowska, North & Macaluso-Haynes,

1981; Ska, Duong & Joanette, 2004; Olness & Ulatowsta, 2011), right hemisphere damage, (e.g. Johns, Tooley & Traxler, 2008; Lehman Blake, 2006; Sherratt & Bryan, 2012), traumatic brain injury (TBI) (e.g. MacDonald, 1992Coelho, Liles & Duffy, 1991; Body & Perkins; 2004) and progressive neurological conditions such as dementia (e.g. Obler & Albert, 1984; Chapman, Highley & Thompson, 1998; Dijkstra, Bourgeois, Allen & Burgio, 2004). The extent to which discourse has assumed a role in the diagnosis and treatment of clinical language disorders has varied according to the nature of each disorder and the degree to which discourse structures and functions are considered to be impaired. The frequently impaired pragmatic aspects of language use seen following right hemisphere damage and TBI, for example, have focused attention on discourse behaviour. Similarly, the dissolution of cognition in progressive neurological disorders has marked out difficulties in conversation and interaction. In contrast, in aphasia, greater emphasis has focused on the linguistic deficits related to the domains of phonology, morphology, syntax and semantics, narrowing our focus to words and sentences. This is not to say that discourse has not been considered in aphasia, as it has been explored diagnostically (see Armstrong, 2000, for an earlier review) with the emergence of some fruitful developments, particularly latterly, in intervention (see Wright, Special Issue of *Aphasiology,* 2011). We are still, however, some way from having robust frameworks that we routinely use within the clinical setting to identify difficulties in discourse and to motivate clinical interventions. A number of reasons are proposed here for the dearth in this area, with perhaps the two most prominent being a lack of clinically accessible assessment frameworks underpinned by theoretical accounts as to how discourse is organised, and a lack of normative data as to how healthy adult speakers structure their discourse. Further, studies of both healthy and disordered discourse have limited their focus to a small number of discourse contexts with minimal exploration of the range of genre that might more closely resemble everyday discourse. This paper will present a framework that

has the potential to provide a theoretically motivated set of principles for use with clinical populations, along with data from healthy adult controls. Through the inclusion of a range of discourse genre, sampled across different topics, the application of these principles to everyday discourse is explored.

Discourse production in healthy adult speakers

Studies of the discourse production of healthy adult speakers have generally sought to examine the variability in discourse, identifying whether discourse characteristics change as a function of age, whether production is influenced by the discourse genre and, in some instances, whether discourse is influenced by different topics. Numerous studies have explored age differences in discourse, particularly macrostructure, or the 'suprasentential organisation' (Glosser & Deser, 1990, p. 69), and provide relatively consistent evidence for gradual age related decline in measures of coherence and cohesion (Halliday & Hasan, 1976). North, Ulatowska, Macalus-Haynes & Bell (1986) compared younger ($\bar{x}$)=45.6 years) and older women ($\bar{x}$)=76.2 years) on two procedural discourse tasks and found that the number of propositions, or steps, produced decreased with age. In addition, anaphoric referencing became more ambiguous, indicating reduced cohesiveness with age. Ulatowska, Hayashi, Cannito & Flemming (1986) also found higher referential ambiguity in older participants. Studies by Ehrlich, Obler & Clark (1997) and more recently, Duong & Ska (2001), found that older participants showed a greater reduction in the organisation of discourse, both conceptually and informatively. Wright, Capilouto, Wagovich, Cranfill and Davis (2005) explored the performance of healthy younger (21-28 years; n=21) and older (57-83 years; n=19) adults on four narratives elicited from different picture stimuli conditions, examining the proportion of main events elicited by the two groups in response to sequenced pictures and single pictures. Younger participants provided significantly more events than the older

group in both conditions. Marini, Boewe, Caltagirone and Carlomagno (2005) explored age related performance on single picture description and cartoon picture sequences. In local coherence measures, i.e. the cohesive ties between words that contribute to meaning, such as referencing and conjunctions, the older group of over 75 year-olds was significantly worse than the other age groups (very young, young, middle and young elderly) in their study, but a linear trend with age was seen. Global coherence, i.e. 'the manner in which discourse is organised with respect to an overall goal, plan, theme, or topic' (Glosser & Deser, 1990, p. 69), was not shown to differ significantly across the age groups although this was felt to be confounded by the significant effects seen across the different elicitation methods. On measures of lexical and thematic informativeness, significant differences were seen between the different groups when contrasting the amount of detail and the main themes. While studies examining microstructure across age have also been carried out, their findings are less consistent (e.g. Nippold, Cramond & Hayward-Mayhew, 2013), and will not be explored further here, with the focus of this paper remaining on macrostructure.

Variability per se across individuals has also been examined in different age groups with Obler et al (1994) reporting an increase in variability with age in the length of a narrative. More recently, Marini et al (2005) found greatest variability on both measures of micro and macrostructure in the oldest group (75-84 years), with the exception of syntactic complexity, global coherence and thematic informativeness. Other age groups showed greater stability of discourse behaviours. These findings suggest that macrostructure does change with age, particularly with respects to the amount of information conveyed, with greater variability also evident in older speakers. Cooper's (1990) study also found significant effects between age and the pictures used to elicit discourse, highlighting that variability in performance can be compounded by the choice of stimuli used.

Exploring discourse genre

One noticeable feature of studies with healthy speakers has been the focus on a relatively restricted number and type of genres, where studies have either focused on only one genre, or two genres to examine variation between them. By far the greatest number of studies that have aimed to profile the discourse of healthy speakers, often with a view to later comparison with clinical populations, have focused on the narrative genre (Coelho, Youse, Le & Feinn, 2003; Sherratt, 2007; Wright & Capilouto, 2009; Fergadiotis & Wright, 2011), with different types of narrative elicitation methods including story retell and/or story generation (Coelho, Liles & Duffy, 1995; Coelho, 2002). Recount has also been used to elicit discourse (Armstrong, 2002; Sherratt, 2007; Olness & Ulatowska, 2011), along with picture description (e.g. Marini, Andreetta, del Tin & Carlomagno, 2011; Fergadiotis & Wright, 2011), a popular context for comparison due to the ease with which it can be used to collect clinical data. Comparisons between genre have also been made, for example, between narrative and recounts (Sherratt, 2007), narratives and picture description (Wright & Capilouto, 2009), narratives and procedural discourse (Hartley & Jensen, 1991), and narratives and conversation (Coelho et al 2003). Marini et al's (2011) study using single pictures and cartoon sequences discussed earlier, stayed within a single genre but varied the method of elicitation, reporting differences between these. Coelho (2002) also found, when comparing story generation to story re-tell, that story generation facilitated a higher number of grammatically complex utterances than in the re-tell task while coherence and cohesion were greater in the latter, suggesting not only that story generation placed greater demands on the speaker and was a more challenging task, but highlighting the difference between discourse using different elicitation methods within the same genre.

Two key limitations of these studies, however, are the small number of genre examined across the same healthy participants and the minimal attention given to the wider range of everyday discourse genres that might both tap into the personal experiences of participants and explore performance in everyday language contexts. The reason for this narrow focus may partially be due to the ease and potential predictability of sampling discourse in certain genres, e.g. using picture description or picture sequences, as well as the lack of frameworks available for organising other everyday genre, such as giving opinions and recounting personal events. Narrative production, for example, has the most well researched organisational framework and accounts for much of the literature in this area while other genres have had less attention paid to their overall structure. The large international databanks developed for dementia (DementiaBank, http://talkbank.org/DementiaBank), TBI (TBI Bank, http://talkbank.org/TBIBank) and aphasia (AphasiaBank, http://talkbank.org/AphasiaBank, MacWhinney, Fromm, Forbes & Holland, 2011) have provided a real opportunity to address this issue by capturing performance across a range of genre (story retell, personal narrative, picture description and procedural discourse). The number of exemplar from each genre is, however, restricted to one topic, and some genre, e.g. picture description, do not represent everyday language contexts.

The structure of everyday discourse

In order to explore any differences between different discourse genres, a framework is needed to characterise the organisation of the individual genre that will also permit examination across the age span of healthy speakers and across different exemplars (or topics). Armstrong (2000) and latterly, Marini and colleagues (2011), have described approaches to discourse analysis as falling either within a structural or functional paradigm where, broadly speaking, structural approaches focus on the constituents of discourse, e.g. the individual lexical and

syntactic components, while functionalist approaches consider the wider social context with an eye to conveying meaning appropriately to the particular interlocutor. Armstrong (2000) further proposed a cognitivist approach, occupying that middle ground where the macrostructure, i.e. 'the overall organisation of the text into meaningful 'chunks', such as orientation, complication, resolution' (p.876) assumes the focus. One study utilising this approach with people with aphasia was conducted by Whitworth (2010) where she adapted a set of organisational frameworks developed for teaching written genre in school- aged children (First Steps, Ministry of Education Western Australia, 1992[1]). This approach identified both micro and macrostructure features that were specific (but often overlapping) to a range of discourse genre that might be found in everyday communication. Extending the model of story grammar from the developmental frameworks for narrative organisation (Stein & Glenn, 1979,), macrostructure features that capture coherence and cohesion in each genre were proposed. The organisational framework of beginning (orientation), middle (body) and end (conclusion) was carried over from the narrative genre to the remaining genres, with the additional genres focused on here being recounts, procedures and expositions (i.e. giving an opinion) (see table 1). All genres were described as having organisational features, similar to story grammar, that introduce and conclude the discourse, with discernable elements in the body of the discourse that set out series of events, steps or statements of opinion. The different genre involved either specific, general or both types of referents, while conjunctions were described as varying from time related connectives in recounts (e.g. later, after, finally) and narratives (next, before, then) to reasoning connectives (e.g. therefore, so, because) in exposition; procedural discourse was regarded as having limited use of connectives although time related connectives (e.g. first, then, after) could be present. The application of a similar framework to other genres, with attention also given to the cohesive functions of referencing

[1] First Steps is still reviewed annually by the Department of Education, Government of Western Australia; the specific content has changed although the principles remain similar.

and conjunctions, was considered intuitively appealing both with respect to organising spoken output and to informing clinical interventions if suitable.

Insert table 1.

Aim

This study aimed to explore whether a multi-genre framework used in child pedagogy is reflected in the structure of everyday discourse produced by healthy adults, within a western culture, and whether there was sufficient consistency across normal performance to underpin assessment and intervention protocols for adults who have impaired language production. Specifically, the study sought to explore the use of coherence (as measured by organisational structure) and cohesion (as measured by reference and conjunctions) within four different genres of discourse in three age groups of young, middle age and older adults. Further, given the wide range of ages seen in the clinical population, the study recruited adults across a wide age range to explore any variability related to age. Finally, by sampling three examples of each genre (narrative excluded), any influences of topic could be examined.

Research Questions

1. Do healthy adult speakers use an organisational macrostructure similar to that proposed in child pedagogy to provide coherence in discourse, across a range of genre, specifically, recount, procedure, exposition and narrative?
2. Is there a difference in the macrostructure used in the four different genres across different age groups, specifically young (20-39 years), middle age (40-59 years) and older (60+ years) adults?

3. Is the macrostructure influenced by topic across the genre of recount, procedure and exposition?
4. Are there differences in the cohesive devices, specifically in referencing and use of conjunctions, used across the four genres and across the three age groups?

Method

Participants

Participants included 30 adult speakers across three age groups: 20-39 years (X=21.6 years; n=10), 40-59 years (X=48.4 years; n=10) and 60+years (X=76.9 years; n=10). Convenience sampling was used to identify competent English speakers with no history of communication impairment or cognitive impairment and with functional hearing. Groups were matched on gender. Demographic information is seen in table 2.

Insert table 2.

Procedure

Ten discourse samples were collected from each participant using the Curtin University Discourse Protocol (see Appendix A). These included three recounts (weekend, last Christmas/family celebration, past injury), three procedures (scrambling eggs, changing a light bulb, planning an event / meal), three expositions (bullying, obesity, global warming) and one narrative (Cinderella). Alternative topics were available but seldom required. Conversational data were collected but are not reported here.

All samples were audio recorded, and later transcribed by a final year Speech Pathology student. Samples were then entered into SALT (Systematic Analysis of Language Transcripts) software (Miller & Iglesias, 2008), segmented into 'communication units'

(Loban, 1976) and then coded for cohesion and coherence using codes for macrostructure based on the First Steps program (see Appendix B for coding protocol). All transcripts were checked by one of the authors to ensure reliability of scoring.

Measures

Coherence was measured through an analysis of the organisational structure (e.g. story grammar in narratives), which involved tallying the number of elements contributing to orienting the listener to the topic/setting the scene, conveying key actions and concluding the topic as well as components specific to the discourse genre (e.g. stating a thesis in an exposition, providing an initiating event within a narrative) (see Appendix B for components coded within the individual genre). In addition to events, steps or statements of opinion in the body of the sample, *evaluative comments* (e.g. *it was fun*) where they did not constitute events or steps but contributed to the intent of the discourse were also tallied, Two separate measures of cohesion were used and drawn from the Whitworth (2010) study with people with aphasia. The first measure, based on the work of Schneider, Dubé and Hayward (2003), was one of referential cohesion, measuring the first mention of new characters and nouns. This attempted to capture the sensitivity of the participant to the listener through their use of lexical items, pronouns and use of determiners. The second measure sought to capture the use of conjunctions, where the number and variety of conjunctions were computed, to identify whether the adult participants used the range of conjunctions within and across genres as hypothesised by the First Steps program.

Results

A. Macrostructure across genre

To address the first question as to whether healthy adult speakers maintain coherence in discourse through adhering to the organisational structure reported in the paediatric literature, the macrostructure of the four different genres of recount, procedure, exposition and narrative was examined across the combined four age groups and topics (see table 3).

Insert table 3.

Recounts

There was a consistent structure involving orientation, sequence of events and conclusion used in recounting an event. All participants provided orientation information, with 100% providing information on characters, 90% on location and 93% on temporality. All participants set out a series of events in the body of the recount, with an average 6.2 events (*sd*: 3.15) across the three topics across all age groups. The number of events showed wide variability across people and topics (range: 1-19 events per topic). Evaluative comments were used throughout the recounts by all participants ($\bar{x}$: 2.9; *sd*: 3.4) to enrich the discourse. 93% of participants provided a Concluding Statement in at least one topic, with 30% of participants adding an End Marker in at least one topic.

Procedures

Only 53% of participants provided any orienting information at the outset by way of re-stating/introducing the topic, however, 100% of participants set out Requirements at the outset. There was an average 5.1 Requirements (*sd*: 2.65) across the three topics across all age groups. The two most consistent characteristics of procedural discourse were the provision of Requirements and Steps by all participants. There was an average 10.4 Steps (*sd*: 4.1) across the three topics across all age groups. The number of Steps showed wide variability across people and topics (range: 2-39 steps across topics and groups). In

concluding the procedure, 53% provided an Evaluative Comment at the end of the discourse, while 47% provided an End Marker.

Expositions

There was a consistent structure involving orientation, statements of opinion and a conclusion in the expositions sampled. All participants provided orientation information by stating a thesis or the issue, and provided statements for and/or against across topics. On a small number of occasions, participants did not include statements for some topics. There was an average 4.64 statements (*sd*: 2.5) across the three topics across all age groups. The number of statements showed wide variability across people and topics (range: 0-15 statements per topic). Evaluative comments were used when providing opinions by all participants ($\bar{x}$: 2.5; *sd*: 2.12). In concluding the task, 80% of participants provided a Concluding Statement, 57% of participants provided an Evaluation Statement and 37% of participants provided an End Marker in at least one topic.

Narrative

There was a consistent structure involving orientation, sequence of events and conclusion used in the narrative task. Nearly all participants provided orientation information related to characters, i.e. 97% of participants, with only 27% providing information on location and 3% on temporality. Orientation of location and time were provided much less than in recounting of events. 25% of participants provided other, un-coded orienting information to enrich the context. Across the groups, there was an average 3.5 characters introduced (*sd*: 1.8). 83% of participants produced an initiating event with 53% responding with a plan or a direct response to this. 97% of participants set out a series of events with an average 12.83 events (*sd*: 9.72) across the groups. The number of events showed wide variability across participants (range: 0-32 events). Evaluative comments were used in the narrative by 77% of the participants ($\bar{x}$: 2.43; *sd*: 3.40) (range: 0-14 comments), similar to

the recount discourse. 80% of participants provided a Concluding Statement, slightly less than in the recounts. 27% of participants added an End Marker, similar to the recounts.

B. Age effects across genre and topic

To address the second question as to whether there was a difference in the macrostructure used in the four different genres across different age groups, i.e. young (20-39 years), middle age (40-59 years) and older (60+ years) adults, the respective data from the three groups was compared (see table 4) using an Kruskal-Wallis oneway ANOVA. Normality was checked using Shapiro-Wilk statistics and homogeneity of variance using Levine's statistic, with the assumptions not violated to any degree. While normal distribution was not seen in all subcategories of macrostructure, the ANOVA is quite robust with respect to moderate violations of the normality assumption (Allen & Bennett, 2010). Where indicated, post hoc analyses were conducted to determine between which pairs of groups the difference was significant. A bonferroni adjusted alpha level of .017 (.05/3) was used to avoid increasing the risk of a type one error. These data are presented here by genre.

Insert table 4.

Analysis of the influence of topic within the everyday genres is also presented here, addressing the third question as to whether the macrostructure is influenced by topic within genres and across the age groups.

Recounts

In recounts, macrostructure was similar across age groups; the only difference between the age groups was a significant difference in the use of Concluding Statements, H (corrected for ties) = 6.458, $df = 2$, $N = 30$, $p = .040$, $\eta^2 = 0.222$ (large effect). The

difference between the age groups was accounted for by the significantly lower use of Concluding Statements by the middle age group compared to the older age group, $U = 20.00$, $z = -2.44$ (corrected for ties), $p = .015$, two-tailed (effect size was large; $r = 0.570$). There was no difference between the groups in the number of events provided.

Topic effects. All topics showed a degree of similarity with orientating information (e.g. introduction of characters), the series of steps or events, and a conclusion used across topics to similar degrees. The only significant difference across topics was seen in the number of Events provided between the three topics in the middle age group when recounting events; no difference was seen in the younger or older age group. In the middle age group, the number of events in the topic, *Weekend*, were significantly higher than *Injury* (Wilcoxon Signed rank test, p=.016) and *Xmas* (Wilcoxon Signed rank test, p=0.021). Other characteristics that did not reach significance was the higher prevalence of location and time used as orienting information in *Weekend* and *Xmas*, and less so in *Injury*, while *Injury* was the only topic to elicit an Initiating Event. End Markers were not used consistently across genre.

Procedures

There were two significant differences between the age groups in the procedural discourse. These were in the number of Steps provided in the method and the use of the End Marker. A significant difference was seen between the number of Steps the groups used in their combined procedures, H (corrected for ties) = 9.459, $df = 2$, $N = 30$, $p = .009$, $\eta^2 =$ 0.326 (small effect size). The number of Steps used by the younger (*Mean Rank* = 14.3) and middle age groups (*Mean Rank* = 13.55,) was significantly higher than for the older age group (*Mean Rank* = 6.70*)*, $U = 12.00$, $z = -2.88$ (corrected for ties), $p = .004$, two-tailed (effect size was large; $r = 0.644$) and $U = 19.50$, $z = -2.31$ (corrected for ties), $p = .021$, two-tailed (effect size was large; = 0.517) respectively. A significant difference was also seen in

the use of the End Marker in their combined procedures, H (corrected for ties) = 7.384, *df* = 2, *N* = 30, *p* = .025, η^2 = 0.255 (small effect size). The use of the End Marker in the younger group (*Mean Rank* = 13.45, *n* = 10) was significantly higher than for both the middle age group (*Mean Rank* = 7.55, *n = 10), U* = 20.50, *z* = -2.43 (corrected for ties), *p* = .015, two-tailed (effect size was large; *r* = 0.542), and the older age group (*Mean Rank* = 7.90, *n = 10), U* = 24.00, *z* = -2.11 (corrected for ties), *p* = .035, two-tailed (effect size was medium; *r* = 0.473).

Topic effects. While topics were similar in eliciting many macrostructure elements, there was a significant difference seen in the number of Steps provided between the three topics in all three age groups during procedural discourse. In the younger and middle groups, *Scrambling Eggs>Changing a Lightbulb>Planning a Meal*, with *Eggs* having significantly more events than *Lightbulb* for the middle group (Wilcoxon Signed rank test *p* = .005) and *Eggs* having significantly more events for both groups (Wilcoxon Signed rank test, *p* = .024, p=.008 respectively). *Planning a Meal* elicited a similar number of events across all ages. This was the lowest number of events for the younger and middle groups but the highest for the older group of all the topics. The standard deviation for the older group for this topic was much higher than all other topics, showing a wide variability within the older age group.

Expositions

In expositions, a significant difference in the number of Statements participants used in their combined expositions, *F* (2,27) = 3.49, *p* = .045, η^2 = 0.205 (large effect) was the only difference noted between the age groups. Post hoc analyses with Tukey's HSD revealed that the younger group used a significantly higher number of statements within their combined recounts in comparison to the older ($\bar{x}$ = 9.80, *sd* = 5.37), *p* = .035 (large effect size; d=1.017). There were no differences between the younger and middle age groups, nor between the middle and older groups.

Topic effects. There was a significant difference seen in the number of Statements provided between the three topics in the younger and older age groups when giving opinions. No difference was seen in the middle age group. In the younger group, the number of statements in the topic, *Obesity*, were significantly higher than *Global Warming* (Wilcoxon Signed rank test, p=.015). In the older group, *Obesity* elicited significantly lower statements than both *Global Warming* (Wilcoxon Signed rank test, p=.009) and *Bullying* (Wilcoxon Signed rank test, p=.017). There was no difference between *Global Warming* and *Bullying*. Similarities were seen across topics with most topics eliciting a thesis, with the exception of *Obesity* for which a thesis was only present in 50% of the older group. Examples and evaluative comments were present in over 50% of all topics across all age groups. Conclusions were also used to a consistent degree across topic. End Markers were, again, not used consistently across genre.

Narrative

The only difference between the age groups in the retell of Cinderella was in the number of Events participants produced, F (2, 27) = 4.203, p = .026, η^2 = .237 (small effect). Post hoc analyses with Tukey's HSD revealed that the number of events that the younger group included in their narratives ($\bar{x}$ = 18.60, *sd*= 10.60) was significantly higher than within the narratives of the older group ($\bar{x}$ = 7.20, *sd* = 6.63), p=0.019 (effect size was large; d=1.116). There were no differences between the younger and middle age groups, nor between the middle and older groups.

C. Cohesive features

In addressing the final question as to whether there are differences in the cohesive devices used across the four genres and across the combined age groups, the data are presented first for use of reference and second for use of conjunctions. Genre and age differences are

discussed within each section. While an ANOVA was conducted to compare referencing data across genre, given the opportunities for referencing were much smaller in the narrative (a single narrative compared to three samples per genre), the narrative genre was not included in these analysis. Similarly, direct comparisons could not be drawn between the narrative and other genres.

Referencing

Genre differences. There was no significant difference in the use of the correct referent being named at the first mention of characters or nouns across the three genres of recount, procedure and exposition, $X^2_f = 1.08$ (corrected for ties), $df = 2$, N – ties = 30, $p = .584$ (see table 5). The standard deviations (*sd*) for the number of referents in all genre were high, highlighting the variability of this measure among participants.

A Friedman two way ANOVA indicated, however, that use of referencing characters and nouns at first mention by using a less specific form, e.g. introducing with a definite determiner or without a determiner, varied significantly across the three genres of recount, procedure and exposition, $X^2_f = 38.18$ (corrected for ties), $df = 2$, N – ties = 30, $p < .001$. Follow-up pairwise comparisons with the Wilcoxon Signed Rank test and a Bonferroni adjusted α of .017, found no difference between recounts and procedures. This form of referencing was used significantly more frequently within the participants combined expositions (*Mean Rank* = 2.88) than within both their combined recounts (*Mean Rank* = 1.50), $T = 406.00$, $z = -4.635$ (corrected for ties), N – ties = 28, $p < .001$, two-tailed (effect size was "large ", $r = 0.876$) and their combined procedures (*Mean Rank* = 1.62), $T = 362.50$, $z = -4.180$ (corrected for ties), N – ties = 27, $p < .001$, two-tailed (effect size was "large ", $r = 0.804$). Use of these forms was also low in narratives, suggesting that only the genre of expositions elicited this less specific form of referencing.

Insert table 5.

The use of only pronouns at first mention (i.e. with no earlier mention of the referent), analysed using a Friedman two way ANOVA, also found a significant difference across the three genres of recount, procedure and exposition, X^2_f = 14.97 (corrected for ties), *df* = 2, *N* – ties = 30, *p* = .001. This difference was accounted for by a significantly higher incidence of this type of referencing in procedures and expositions than in recounts. Follow-up pairwise comparisons with the Wilcoxon Signed Rank test and a Bonferroni adjusted α of .017 indicated that use of pronouns at first mention was used significantly more in the combined procedures (*Mean Rank* = 2.33) than within the combined recounts (*Mean Rank* = 1.48), *T* = 219.00, *z* = -3.090 (corrected for ties), *N* – ties = 22, *p* = .002, two-tailed (effect size was "large ", *r* = 0.659), and in the combined expositions (*Mean Rank* = 2.18) than within their combined recounts (*Mean Rank* = 1.48), *T* = 222.50, *z* = -2.659 (corrected for ties), *N* – ties = 23, *p* =.008, two-tailed (effect size was "large ", *r* = 0.554).

Age differences. When usage was examined across the different age groups, there were no differences seen in either recounts or procedures (see table 6) in the use of specific referencing. Significant differences were seen however in combined expositions and the narrative. In expositions, a Kruskal-Wallis ANOVA indicated that there was a statistically significant difference in the use of specific referencing on first mention, H (corrected for ties) = 10.290, *df* = 2, *N* = 30, *p* = .006, η^2 = 0.355 (large effect). Post hoc analyses with a bonferroni adjusted alpha level of .017 (.05/3), found that both the younger group (*Mean Rank* = 7.00*)* and the middle age group (*Mean Rank* = 13.95) used significantly more specific references than the older group (*Mean Rank* = 7.05), *(U* = 15.00, *z* = -2.654 (corrected for ties), *p* = .008, two-tailed; *r* = 0.593, large effect, and *U* = 15.50, *z* = -2.615 (corrected for ties), *p* = .009, two-tailed; *r* = 0.585, large effect, respectively). No differences were seen

between the two younger groups. A significant difference was also seen in narratives for specific references on a Kruskal-Wallis ANOVA (H (corrected for ties) = 8.029, *df* = 2, *N* = 30, *p* = .018, η^2 = 0.277, large effect) and was accounted for by participants in the older group (*Mean Rank* = 7.30*)* using a significant lower number of specific references than the younger group (*Mean Rank* = 13.70) (*U* = 18.00, *z* = -2.436 (corrected for ties), *p* = .015, two-tailed; *r* = 0.545, large effect).

Insert table 6.

No differences were seen in the use of less specific referents for recounts, procedures or narratives. While a Kruskal-Wallis ANOVA indicated that there was a statistically significant difference in the combined expositions (H (corrected for ties) = 6.271, *df* = 2, *N* = 30, *p* = .043, η^2 = 0.216, large effect), post hoc analyses indicated that the higher use of this form of referencing by the younger group than the older two groups was not significant when a bonferroni adjusted alpha level of .017 (.05/3) was applied.

With respect to pronouns being used at first mention, no significant differences across age were seen for recounts or procedures. An ANOVA revealed a significant difference for expositions **(**H (corrected for ties) = 7.12, *df* = 2, *N* = 30, *p* = .028, η^2 = 0.246; large effect) which, following post hoc analyses with a bonferroni adjusted alpha level of .017 (.05/3), was accounted for by the younger group (*Mean Rank* = 13.60) using pronouns significantly more frequently than the middle age group (*Mean Rank* = 7.40) (*U* = 19.00, *z* = -2.415 (corrected for ties), *p* = .016, two-tailed; *r* = 0.540, large effect)). No other differences between groups were found. An ANOVA also revealed a significant difference within narratives (H (corrected for ties) = 6.032, *df* = 2, *N* = 30, *p* = .049, η^2 = 0.208; large effect). Post hoc

analyses indicated that the higher use of this form of referencing by the younger group than the oldest group was not significant when a bonferroni adjusted alpha level of .017 (.05/3) was applied.

Conjunctions

Due to the variety and spread of conjunctions, raw data was scrutinised for frequency and patterns (see table 7) across combined samples and then means calculated per genre sample. The single longer narrative limited direct comparisons with this genre.

Insert table 7.

Adversative. Adversative conjunctions were used frequently across all genres. The most common adversative was *but* with only minimal use of other adversative conjunctions.

Causal. Causal conjunctions were also used frequently across all genres, with combined expositions showing a significantly higher frequency within the everyday discourse than combined recounts (Fisher exact, $z=1.87$, $p<.031$ one tailed). These conjunctions were also high in the narrative. The most common causal conjunction was *so,* being used by most participants, followed by *because*. In expositions, both of these conjunctions were used to an equal degree. There was minimal use of other causal conjunctions.

Conditional. Conditional conjunctions were used significantly more frequently by participants in combined procedural (Fisher exact, $z=4.06$, $p<.001$ two tailed) and expository (Fisher exact, $z=2.94$, $p=.003$ two tailed) genres than recounts, with relatively few incidences seen in narratives. There was no difference between procedures and recounts, nor between recounts and narratives. The most common conditional conjunction was *if* with only minimal use of other conditional conjunctions.

Temporal. Temporal conjunctions were used frequently by participants across all genre. These were high in narratives, occurring with a similar frequency to causal conjunctions. Of the everyday genre, temporal conjunctions were used significantly more often in combined procedures then combined recounts (Fisher exact, z=2.62, p=.009 two tailed) and significantly less frequently in individual expositions (Fisher exact, z=2.35, p=.019 two tailed) compared to procedures. The most common temporal conjunctions were *then/and then* with only minimal use of other temporal conjunctions.

Age differences were scrutinised across the spread of conjunctions and across genre with no notable differences detected.

Discussion

This study aimed to explore whether healthy adults structure their discourse using a multi-genre macrostructure framework similar to that set out in child pedagogy and whether any organising principles were sufficiently consistent, across and within genres, such that they may be applied to understanding the discourse of adult clinical populations. Age effects were analysed to determine whether performance altered with age, and topics scrutinised to identify any patterns of variability.

Macrostructure for coherence

Findings showed that the macrostructure to develop and maintain coherence proposed for all four genres (recounts, procedures, expositions, narratives) were consistently used by healthy speakers, and adhered closely to the different elements set out by the approach for developing written discourse in the First Steps program (see table 1). All participants organised their discourse around the orientation, body and conclusion of each topic within a

genre, the nature of which related specifically to the genre. Orienting information for recounts and narratives was always present in the establishment of characters and context (e.g. temporal, location), while expositions were introduced by stating a thesis, and procedures by setting out requirements prior to commencing the steps involved. Interestingly, other orienting information was infrequently used in procedural discourse, with only 53% of participants provided any orienting information at the outset by way of re-stating the topic. It is quite possible that this finding was influenced by the nature of the task (i.e. the aim of the procedure was set out by the administrator), such that different introductory behaviour may be seen when procedures are initiated by the speaker.

The body of the genres were clearly identifiable by the progressive sequencing (for events or steps) or listing (for statements of opinion) of information required/remembered to complete the discourse. Again, variation between the genres was seen but these were consistent within the genre. Recounts and narratives, for example, frequently elicited an initiating event prior to the unfolding of subsequent events while opinions elicited examples to support the statements of fact. Evaluative comments (e.g. *I liked her, it was great fun*) were evident throughout recounts, expositions and the narrative to embellish and personalise the account, but not present during procedural discourse. The conclusion of the discourse was also consistently marked in some way across genre. In recount, expositions and narrative, this was performed by a concluding statement or event related to the content (this was provided by 80% or more of participants in any one genre) or by an evaluative comment in over 50% of participants' procedures. The remaining participants provided a generic end marker (e.g. *that's it*), either in isolation or in addition to a more content based conclusion. End markers ranged from 27% in the narrative to 47% in the procedures, suggesting a relatively frequent but inconsistently used feature. These findings suggest that these frameworks are useful as a

measure of organising all four discourse genre and not simply restricted to narrative, and therefore likely to be used within everyday speaking contexts when a variety of genre are activated.

Macrostructure for cohesion

Analysis of referencing patterns across the genres was entirely consistent with the specifications set out earlier in table 1. Findings showed that all participants used specific referencing when first introducing characters or objects and this was frequent and consistent. Generic referencing patterns, however, were demonstrated, additionally, in the expositions and procedures, a feature proposed within the developmental framework. Most speakers introduced characters or objects at some stage by using a less specific form in each of the genre, e.g. introducing with a definite determiner or without a determiner, but this was infrequent, with the exception of expositions where it was significantly higher than in both recounts and procedures. This form of referencing rarely occurred in narratives. A similar pattern was seen for both expositions and procedures in the significantly higher use of pronouns on first mention, compared to recounts, coupled with the low incidence of pronoun referencing in narratives. This is consistent with the genres of recount and narrative requiring more explicit referencing while expositions and procedures draw on both specific and generic forms of referencing.

Conjunctive cohesion again showed a consistency with the projections from the developmental framework, although there were some additional findings to note. As expected, temporal conjunctions were frequently present in recounts, procedures and narratives, and, equally, were less frequent in expositions. Temporality was still, however, present in this latter genre. Causal and conditional conjunctions were combined to reflect 'reasoning conjunctions', proposed to occur to a higher degree in expositions. This was

indeed the case. Interestingly, these were also both high in procedural discourse. Recounts and narrative, however, only elicited causal conjunctions with limited use of conditional conjunctions. These findings provide support for the use of different conjunctions as cohesive devices in the different genres.

Age differences

The presence of age related differences in discourse organisation using the macrostructure set out in this paper is consistent with previous findings. Overall organisational coherence was maintained over the age groups with the key difference being in the significant reduction in amount of information in the body of the discourse. North et al (1986), for example, had found that older people provided a reduced number of steps in procedures while Wright et al (2005) had found a reduction in main events in narratives with age. The current study showed a significant reduction in the number of steps (in procedures), the number of statements of fact/opinion (in expositions) and the number of events (in narratives). Performance here was only consistent across age in the recount genre. A number of other changes were noted related to age but these occurred in an isolated genre and were not considered robust. With respect to cohesion, a significant reduction was seen in the use of specific referents on first mention in the older group relative to the two younger groups in expositions; this was not seen in the other three genres. No age differences were seen in the use of conjunctions.

Influence of topic

Examination of performance across the different topics highlighted subtle differences across topics suggesting that topic does need to be considered when interpreting samples. Within recounts, some topics were less variable (e.g. *Injury* and *Xmas* in the middle age group for recounts), suggesting these as potentially more equitable as a topic for specific age groups. Some topics were also more likely to elicit an Initiating Event (e.g. recounting *Injury* across all ages) with less attention to the orientation components of Location and Time, while

others (e.g. *Xmas*) elicited more orienting components but no initiating event. In procedural discourse, greater variability was seen with some topics across age groups (e.g. *Scrambling Eggs* elicited significantly more steps in the younger group, as did *Changing a Lightbulb* between the younger and older group) with less variability seen in others (e.g. *Planning a Meal*). While the suggestion of less variability may, however, make a topic appealing for use across age groups, the within-group variability also requires consideration; for example, *Planning a Meal* was highly variable within the older group, potentially makes it less robust for older clients. Topics in expositions were similar (e.g. *Global Warming* and *Bullying* were less variable than *Obesity*), although the findings highlighted that some topics (e.g. *Bullying*) elicited more events with a similar degree of variability, potentially indicating higher potential for eliciting an exposition sample across age groups.

Clinical implications

The clinical implications of this study are significant for both diagnosis and intervention across a range of clinical populations. Diagnostically, the data demonstrate that healthy speakers employ consistent features in maintaining coherence and cohesion that, if not present and available to the speaker, may well result in difficulties in the overall organisation and coherence of the discourse and/or the inappropriate reliance on or restricted use of cohesive ties, such as referencing or conjunctive devices denoting temporality or causality (this may be appropriate for some but not all discourse genres). The implications for both the person with the communication impairment and the communication partner in terms of comprehending and maintaining discourse are likely to be significant. Further, the identification of a consistent structure across genre, allowing for the differences of the individual genre, provides a clinically accessible framework with which to identify the presence and absence of components in a range of everyday discourse. The consistency seen

across the age groups in the study also offers confirmation as to the obligatory discourse components while raising awareness of the reducing information contained within the body of discourse (with the exception of recounts) with age. As to whether different clinical populations are associated with the same or different discourse profiles on this framework is as yet unknown, but sampling of different clinical groups may offer interesting insights into the impact of different neurological impairments on discourse. For intervention, the consistency of the components provides a potentially tangible framework to underpin treatment programs aimed at developing awareness and facilitating practice in discourse with communication impaired individuals. While the quantifiable analysis of components in this study will only likely act as a guide diagnostically with respect to identifying difference from healthy speakers, these may prove to be useful outcome measures when capturing change following intervention. And, of perhaps greatest note, is the potential for the framework to facilitate greater discourse organisation in everyday speaking situations where multiple genre are frequently drawn on to communicate.

Conclusion

The application of specific macrostructure frameworks from the developmental literature has enabled the concept of story grammar to be successfully transposed to the analysis of healthy adult discourse in a range of discourse genre that extends beyond narrative. The consistency with which healthy adults structure their production to ensure coherence and cohesion provides evidence for the presence of routines that likely facilitate both comprehension and production of speaking. Further, the consistent organisation of macrostructure across the lifespan demonstrates their robustness, both reinforcing the appropriateness of the models for child learning as well as demonstrating those elements that are most prone to decline with age. The clinical implications, however, for people with disordered communication are

significant. These data provide a tangible framework for people working with clinical populations, providing normative data against which to assess difference and/or impairment and, potentially, inform intervention strategies to facilitate coherence and cohesion in everyday speaking contexts.

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Appendix A

Curtin Discourse Protocol and Script

There are 10 items in the Protocol.

Items 1-3: Recounting an event

Items 4-6: Explaining a procedure

Items 7-9: Giving an opinion

Item 10: Telling a story

Alternative suggestions are included and are to be used only when necessary, i.e. when the suggested topics are considered to be inappropriate, sensitive or, for any reason, difficult (e.g. too long since an event). The Protocol is audio-recorded.

A 5 minute conversation is recorded at the end. It is important to elicit the conversation after the Protocol items to avoid the topics being raised spontaneously in conversation.

Keep dialogue during tasks to a minimum. Use either nonverbal (e.g., head nods, facial expressions, eye contact) or minimal verbal encouragers (e.g., "I see", "mhm", "yeah") whenever possible. It's fine to encourage with "Can you tell me anymore?" if necessary. Reword as appropriate.

Begin recording

Thank you for talking with me today. I am going to ask you to tell me about some different things. For each question, just say whatever comes to mind. I'm not going to interrupt you.

I've turned the recorder on so I can listen to what we say later on.

SECTION l: RECOUNT

The aim is to trigger and elicit a recent memory of an event (either recent or memorable) that can be recounted. Aim to elicit all three. Each response should be capped at 5 minutes.

I'll start by asking you to tell me about three specific things that have happened to you. The first one…

1. Weekends are often a time to relax or catch up with people. Can you tell me what you did last weekend?
2. Certain times of the year are very important times for families to get together, such as Christmas (If Hannakah or Ramadan are more appropriate, establish which and substitute "Which one do you celebrate?") What did you or your family do on (*Christmas day)* last year?
3. Have you ever had an injury or accident? Can you tell me what happened?
   Alternative prompts if no response: What about a close friend or family member? Can you think of anyone that has been in an injury or car accident? What happened to

them? Can you remember a recent celebration, such as a birthday, anniversary, wedding or party that you have been to? Can you tell me about it?

SECTION II: PROCEDURE

The aim is to trigger and elicit a text that will provide a procedural discourse. Aim to elicit all three. Each response can be capped at 5 minutes.

Let's move on to something a little different. This time you need to tell me how to do some things.

4. Can you imagine (or pretend) that I've never changed a light bulb before. Can you tell me how I would do this?
5. We all like to have friends over for a meal. Can you tell me how you would go about planning or organising such an event.
6. Can you imagine (or pretend) that I have never cooked for myself before. Could you explain to me how to make scrambled eggs?

   Alternative prompts if no response: What about a cup of tea? Can you imagine that I have just arrived in this country and was very unfamiliar with how things work, even very simple tasks, and I wanted to go shopping for food. Can you explain to me how I would go about shopping for food or groceries?

SECTION III: EXPOSITION

The aim is to trigger and elicit a text that will provide an opinion. Aim to elicit all three. An alternative set of topics are listed below if participants are younger or topics are considered more appropriate. Each response can be capped at 5 minutes

Now I'm going to ask you for your opinion on some topics. There is no right or wrong answer.

7. Global warming. What do you think about global warming and why?
8. Obesity. What's your opinion on obesity and why it seems to be increasing?
9. Bullying seems to be becoming more of a problem for both children and adults in the workplace. What do you think about bullying and why?

   Alternative prompt if no response: In times of crisis, many wealthy countries give aid to poorer countries. What do you think about this any why? Some countries still have the death penalty for particular crimes. What do you think about the death penalty, or capital punishment, and why? What do you think about the legal drinking age being 18 and why? Parents are legally responsible for the crimes of their children. What do you think about this and why?

SECTION IV: NARRATIVE

Aim to elicit the story of Cinderella. The response can be capped at 5 minutes.

Now we are going to change to something different.

10. Can you to tell me the story of Cinderella.

    Alternative prompt if no response: Tell me the story of your favourite fairy tale. Tell me the story of your favourite movie or television show.

SECTION V: CONVERSATIONAL DISCOURSE

Aim to elicit a conversational sample of approximately 5 minutes. Use open ended questions (this will not always be possible). Allow time for the person to respond. Ask about their family, their experience of having had a stroke/ head injury/trauma, what their views are on hospital/rehabilitation, hobbies etc. Be interactive and encourage the participant to talk. Remember to use nonverbal (e.g., head nods, facial expressions, eye contact) or minimal verbal encouragers (e.g., "I see", "mhm", "yeah") to maintain the conversation.Be encouraging and positive.

Thank you for your time.

Appendix B
Coding for coherence and cohesion of discourse macrostructure

Communication Units (C-units) (as set out in Miller & Iglesias, 2008) were defined as the main clause with a subordinate clause involving temporal and causal conjunctions, and subsequent co-ordinating (or additive) clauses where the subject was carried over. Comments on the task itself (e.g. *I keep forgetting, this is hard*) are not coded unless they include mention of the actual procedure or event etc specific to the genre.

Coherence

Element	Definition	Code
For all texts		
Repeating or rephrasing the stimulus question	Where the participant starts by repeating or rewording the topic or question. e.g. *hmmmm how do you do a scrambled egg [RSQ]*. e.g. *oh yes, the story of Cinderella [RSQ]*.	[RSQ]
End marker	These are usually stereotypical, e.g. t*he end* or *that's it* or *that's pretty much the whole thing*. These statements are not analysed further for verbs, arguments, etc.	[End]
Recount		
Orientation/setting	Who/where/when and maybe what - Character [OC], Location [OL], Time [OT], Other [OO]. This information usually occurs at the beginning but may be scattered within the recount. [OO] is marked cautiously, occurs infrequently and refers to information other than character, time and place. e.g. *(but I um yes) so (I'd we went down to) my boyfriend and I went down to Mandurah for the weekend <u>for our anniversary</u> [OO]*.	[OC] [OL] [OT] [OO]
Initiating Event	An initiating event [IE] will contain some form of causal kick-off; it is the event that initiates the series of events that follow, or a reason. It is not simply the initial event. There may be no [IE] present; it is most frequently seen in narratives. e.g. *(1) the weekend before last I pull/ed a ligament in my back [OT] [OC] [E]*. *(2) and what happen/ed was I went to do a wheely on a friend/z bike [IE]*. In (1), the E is the first in a series of events, i.e. an initial event but not an initiating event; this emerges in (2). e.g. *Last Christmas_day we had[LV] family from interstate over [A3] [OT] [OC] [E]*. In the final example, the initial event is not an initiating event.	[IE]
Events (key)	What happened; often a series of repeated events or sub-events. Each event is only counted once if it is repeated without any further elaboration.	[E]
Evaluative comments	Evaluative comments during the recount that are not events but contribute to the recount. e.g. *it was fun [EC]*. e.g. *I liked it [EC]*.	[EC]

Conclusion	A concluding statement that is part of the narration of the event itself. This may be an EC but has a concluding function. e.g. *and then we went home [Conc]*.	[Conc]
Procedure		
Aim/Goal	States the overall purpose or question as a sort of goal of the task e.g. *if I was going to make change a lightbulb… [G]*. (nb. This element was not seen in the normal data reported here.)	[G]
Requirements	Lists the materials/requirements, either as a separate list at the start of the sample or embedded within the steps.	[Req]
Method/steps	Details the process in a series of steps (the requirements, e.g. utensils or ingredients, may be embedded within). Each step is only counted once if it is repeated without any further elaboration.	[M]
Evaluation	A reflective and evaluative statement at the end. e.g. *I make the best scrambled eggs [Ev]*.	[Ev]
Exposition		
Thesis or issue	Highlights the key argument/thesis/issue in an opening evaluative style statement. This is more than just restating the question as in an [RSQ].	[Th]
Statements/points elaborating a position	Makes a series of points which may provide support for or refute the thesis and elaborates on them. Each statement is only counted once if it is repeated without any further elaboration.	[S]
Examples	Provides a supporting example or to justify a point.	[Ex]
Evaluative comments	Evaluative comments that do not fit as statements for or against the topic; could be an opinion, e.g. *I like it, I don't like it.*	[EC]
Conclusion/ recommendation	Comes to a point of view at the end.	[Conc]
Evaluation	A reflective and evaluative statement at the end.	[Ev]
Narrative		
Orientation/setting	Who/where/when and maybe what - Character [OC], Location [OL], Time [OT], Other [OO]. This information usually occurs at the beginning but may be scattered within the recount. [OO] is marked cautiously and refers to information other than character, time and place. See Recount for example.	[OC] [OL] [OT] [OO]
Initiating Event	An initiating event [IE] will contain some form of causal kick-off; it is the event that initiates the series of events that follow, or a reason. It is not simply the initial event. There may be no [IE] present. See Recount for examples.	[IE]
Response/plan	Response to initiating event which may involve a plan by a character.	[Res]
Events	What happened; often a series of repeated events or sub-events. Each event is only counted once if it is repeated	[E]

	without any further elaboration.	
Evaluative comment	Evaluative comments during the recount that are not events but contribute to the recount. These may include evaluations of the story such as personal comments or opinions that enrich but do not progress the story, e.g. *she was mean, they were jealous, she was a bombshe*ll.	[EC]
Conclusion	A concluding statement that is part of the narration of the event itself. This may be an EC but has a concluding function and is part of the resolution of the story, e.g. *and then they got married*.	[Conc]

Cohesion

Element	Definition/Examples	Code
Conjunctions		
Temporal conjunctions	To capture number and variety of temporal conjunctions. Examples: And, then, first, next, last, and, when, then, now, until, while. Notation: [TC:until] etc. *And* [TC:and] and *and then* [TC:and then] are counted as separate conjunctions.	[TC]
Causal conjunctions	To capture number and variety of causal conjunctions. Examples: Because, as, why, so, nevertheless, moreover. Notation: [CC:because] etc.	[CC]
Adversative conjunctions	To capture number and variety of adversative conjunctions. Examples: But, except, however, or, rather than, then again, whereas. Notation: [AC: but] etc.	[AC]
Conditional/consequential conjunctions	To capture number and variety of conditional/consequential conjunctions. Examples: Therefore, whether, although, if, which, unless, whereas. Notation: [CondC:although] etc.	[CondC]
Reference		
Specific reference to participants and objects	Direct and specific reference on first mention that provides the listener with the correct amount of information to identify the referent. This applies to specific participants, e.g. *dad*, *the teacher* or *the nurse*, and generic referents, e.g. *the egg*, *the player*. Appropriate first mentions use an indefinite determiner, names (proper nouns), introduction with 'this' (e.g. *this ball*), introduction with a possessive determiner, (e.g. *an/her invitation*), relative clauses, e.g. (*the lady he married/fathers wife*), introduction with quantification e.g. *two little boys*.	[R3]
Non-specific reference to participants and objects	Indirect and non-specific reference on first mention that provides some but not all the necessary information to the listener to identify the referent. Characters and objects are introduced with a definite determiner, e.g. *a girl* (rather than *the girl*), *a chair* (rather than *the chair*). Objects might be	[R2]

	introduced without a determiner e.g. *girl* (as opposed to *the girl*).	
Pronoun only	Use of the pronoun only, e.g. *he/she*, on first mention of a character where there has been no prior introduction of the referent. This includes introduction of objects with pronouns, e.g. *it/they*, where no referent has been used earlier.	[R1]

Table 1. Characteristics of discourse structure for narrative, recount, procedural and exposition (adapted from First Steps, Ministry of Education, Western Australia, 1992)

Genre	Function	Organisational framework			Cohesive features	
		Orientation	**Body**	**Conclusion**	**Conjunctions**	**Reference**
Recount	To tell or retell a personal or reported experience	Orientation of title/topic, setting context: key characters (who, where, what, when)	An initial (first) event followed by a series of time ordered sequenced events	Re-orientation to event (optional) Evaluation (optional) (personal comment, reaction)	Time related connectives (e.g. later, next, after, before, finally)	Specific participants (1st, 2nd and/or 3rd person)
Procedural	To explain or give instructions on how to achieve a goal or carry out an activity	Statement of the goal (may include what, who, where, when) Materials required	Series of factual steps involved in sequential order	Evaluation (optional) (personal comment)	Limited use Time related connectives (e.g. first, after, when, as soon as, finally)	General participants (e.g. ingredients) and specific participants (single items)
Exposition	To argue or persuade (thesis presented from a particular point of view)	Overall statement or position (thesis)	Supporting statements or assertions (series of pros and cons)	Reiteration of opening statements	Reasoning connectives (e.g. therefore, so, because)	General participants and specific participant (often self)

Narrative	To tell a story and entertain	Orientation of title/topic, setting context, key characters (who, where, what, when)	A catalyst event (initiating event) A series of time ordered sequenced events Conflict and resolution (main and resolving events)	A concluding statement or comment Evaluation (optional) (personal comment, reaction)	Time related connectives (e.g. then, next, before)	Specific participants (1st or 3rd person)

Table 2. Participant characteristics

Age Group	$\bar{x}$ years	Range of years	M	F
20-39 years	21.6	20-23	4	6
40-59 years	48.4	45-52	5	5
60+ years	76.9	63-89	6	4

Table 3. Coherence measures across the four genres for the total participant group (topics combined within everyday genre)

Genre	Macro-structure element	Code	No. participants (*n = 30*)	$\bar{x}$ (sd)
Recount	Orientation/setting	[OC]	30	4.17 (1.58)
		[OL]	27	2.63 (1.71)
		[OT]	28	2.83 (1.66)
		[OO]	8	0.47 (0.94)
	Initiating event	[IE]	29	1.07 (0.37)
	Events	[E]	30	18.70 (9.46)
	Evaluative comments	[EC]	30	8.57 (10.27)
	Conclusion	[Conc]	28	1.57 (0.86)
	End marker	[End]	9	0.37 (0.61)
Procedure	Restating topic	[RSQ]	16	0.57 (0.57)
	Aim/ Goal	[G]	0.00	0 (0)
	Requirements	[Req]	30	15.27 (7.95)
	Method/ steps	[M]	30	31.27 (12.42)
	Evaluation	[Ev]	16	0.70 (0.79)
	End Marker	[End]	14	0.63 (0.81)
Exposition	Thesis or issue	[Th]	30	3.03 (0.72)
	Statements	[S]	30	13.93 (10.72)
	Examples	[Ex]	30	7.43 (6.36)
	Evaluative Comments	[EC]	30	5.53 (4.49)
	Conclusion/ recommendation	[Conc]	24	1.57 (1.04)
	Evaluation	[Ev]	17	1.07 (1.26)
	End Marker	[End]	11	0.43 (0.63)
Narrative	Orientation	[OC]	29	3.47(1.81)
		[OL]	8	0.30 (0.53)
		[OT]	1	0.03 (0.18)
		[OO]	25	2.40 (2.37)
	Initiating Event	[IE]	25	0.83 (0.38)
	Response/ plan	[Res]	16	0.53 (0.51)
	Events	[E]	29	12.83 (9.72)
	Evaluative Comment	[EC]	23	2.43 (3.40)

	Conclusion	[Conc]	24	0.87 (0.57)
	End marker	[End]	8	0.27 (0.45)

Table 4. Coherence measures across the four genres for the three age groups (combined topics within everyday genre)

Genre	Macro-structure element	Code	Age Group						Difference across groups [b]
			20-39 years (A)		40-59 years (B)		60+ years (C)		
			No. [a] *(n = 10)*	$\bar{x}$ (sd)	No. [a] *(n = 10)*	$\bar{x}$ (sd)	No. [a] *(n = 10)*	$\bar{x}$ (sd)	
Recount	**Orientation/setting**	[OC]	10	3.5 (0.97)	10	4.3 (1.57)	10	4.7 (1.95)	*p* = .229
		[OL]	7	2 (1.70)	10	2.7 (1.34)	10	3.2 (1.99)	*p* =.299
		[OT]	10	2.1 (0.57)	9	3.4 (1.90)	9	3 (2)	*p* =.205
		[OO]	5	0.7 (0.82)	3	0.7 (1.34)	0	0 (0)	*p* = .056[c]
	Initiating event	[IE]	9	1.2 (0.63)	10	1 (0)	10	1 (0)	*p* = .329[c]
	Events	[E]	10	23.6 (10.16)	10	18.4 (9.48)	10	14.1 (6.72)	*p* = .075
			Range: 12-43		Range: 5-39		Range: 6-28		
	Evaluative comment	[EC]	10	10.3 (13.61)	10	5.2 (3.91)	10	10.2 (10.97)	*p* = .357[c]
			Range: 1-48		Range: 2-12		Range: 2-40		
	Conclusion	[Conc]	10	1.8 (0.92)	8	1 (0.67)	10	1.9 (0.74)	*p* = .040[c] *
			Post hoc: A v B (*p* = .055[)] *; B v C (*p* = .015[)] *						
	End marker	[End]	4	0.6 (0.84)	3	0.3 (0.48)	2	0.2 (0.42)	*p* = .497[c]
Procedure	**Restating topic**	[RSQ]	6	0.6 (0.52)	5	0.5 (0.53)	5	0.6 (0.70)	*p* = .916
	Aim/ Goal	[G]	0	0 (0)	0	0 (0)	0	0 (0)	n/a
	Requirements	[Req]	10	15.7 (4.50)	10	15.3 (10.48)	10	14.8 (8.56)	*p* = .453
	Method/ steps	[M]	10	35.3 (9.63)	10	35.2 (14.71)	10	23.3 (9.06)	*p* = .009 *

			(A v B): p = .545		(B v C): p =.021		(A v C): p = .004		
			Range: 26-58		Range: 19-59		Range: 14-46		
	Evaluation	[Ev]	5	0.7 (0.82)	5	0.8 (1.03)	6	0.60 (0.52)	p = .994
	End Marker	[End]	8	1.2 (0.92)	3	0.3 (0.48)	3	0.4 (0.70)	p = .025 *
			Post hoc: A v B (p = .015) *; B v C (p =.888); A v C (p = .035) *						
Exposition	**Thesis or issue**	[Th]	10	3.30 (0.48)	10	2.70 (0.48)	10	3.10 (3.69)	p = .125[c]
	Statements	[S]	10	18.00 (7.96)	10	14.00 (7.24)	10	9.80 (4.22)	p = .0458*
			Post hoc: A v B (p = .414*);* B v C (p = .379); A v C (p = .035) *						
			Range: 6-28		Range: 5-27		Range: 3-19		
	Examples	[Ex]	10	7.50 (7.58)	10	5.2 (3.01)	10	9.60 (3.69)	p = .321
	Evaluative Comments	[EC]	10	6.10 (5.20)	10	4.60 (3.50)	10	5.90 (3.69)	p = .845[c]
			Range: 1-16		Range: 1-9		Range: 1-17		
	Conclusion / recommendation	[Conc]	8	1.60 (1.07)	9	1.80(0.92)	7	1.30 (3.69)	p = .573
	Evaluation	[Ev]	4	0.70 (1.06)	5	0.60 (0.70)	8	1.90 (3.69)	p = .054[c]
	End Marker	[End]	6	0.80 (0.79)	3	0.30 (0.48)	2	0.20 (3.69)	p = .106[c]
Narrative	**Orientation**	[OC]	10	4.40 (2.32)	10	3.50 (1.27)	9	2.50 (1.27)	p = .106[c]
		[OL]	1	0.10 (0.32)	3	0.40 (0.70)	4	0.40 (0.52)	p = .326[c]
		[OT]	0	0 (0)	0	0 (0)	1	0.10 (0.32)	p = .368[c]
		[OO]	8	1.40 (1.43)	9	3.80 (3.22)	8	2 (1.49)	p = .141[c]
	Initiating Event	[IE]	8	0.80(0.42)	9	0.90 (0.32)	8	0.80 (0.42)	p = .793[c]

	Response/ plan	[Res]	3	0.30 (0.48)	8	0.80 (0.42)	5	0.50 (0.53)	p = .085[c]
	Events	[E]	10	18.60 (10.60)	10	12.70 (8.71)	9	7.20 (6.63)	p = .026 *
			Post hoc: A v B (p = .307); B v C (p =.356); A v C (p = .019) *						
			Range: 2-32		Range: 1-28		Range: 0-20		
	Evaluative	[EC]	9.	3.10 (2.60)	6	1.70 (3.33)	8	2.50 (4.28)	p = .058[c]
	Comment		Range: 0-9		Range: 0-11		Range: 0-14		
	Conclusion	[Conc]	9	1.10 (0.74)	7	0.70 (0.48)	8	0.80 (0.42)	p = .357[c]
	End marker	[End]	4	0.40 (0.52)	3	0.30 (0.48)	1	0.10 (0.32)	p = .316[c]

[a] Number of participants who used the macrostructure element within their combined recounts.

[b] Difference in use of macrostructure element across the 3 groups

[c] Kruskal-Wallis One-Way ANOVA

*Significant at <0.05

Table 5. Reference measures across the four genres collapsed for age (topics combined in everyday genre)

Reference Type	Code	Recount *(n = 30)*		Procedure *(n = 30)*		Exposition *(n = 30)*		Difference between genre	Narrative *(n = 30)*	
		No.[a]	$\bar{x}$ (sd)	No.[a]	$\bar{x}$ (sd)	No.[a]	$\bar{x}$ (sd)		No.[a]	$\bar{x}$ (sd)
Specific	[R3]	30	24.33 (9.73)	30	25.10 (9.94)	30	23.13 (12.87)	p = .584	30	10.53 (7.36)
Non-specific	[R2]	28	1.67 (.96)	25	1.80 (1.24)	30	5.53 (3.25)	p < .001*	5	0.27 (0.64)
		Post hoc: Recount v procedure (p = .706); Procedure v exposition (p < .001) *; Recount v exposition (p < .001) *								
Pronoun only	[R1]	10	0.53 (0.94)	25	1.43 (1.20)	19	1.33 (1.47)	p = .001*	5	0.17 (0.38)
		Post hoc: Recount v procedure (p = .002) *; Procedure v exposition (p < .750); Recount v exposition (p =.008) *								

[a] Number of participants who used the type of reference within their combined recounts.

*Significant at <0.05

Table 6. Reference measures across the four genres across three age groups (topics combined in everyday genre)

Genre	Reference type	Code	Age Group						Difference between groups
			20-39 years (A)		40-59 years (B)		60+ years (C)		
			No.	$\bar{x}$ (sd)	No.	$\bar{x}$ (sd)	No.	$\bar{x}$ (sd)	
Recount	Specific	[R3]	10	28.10 (13.26)	10	21.90 (4.46)	10	23 (9.21)	*p* = .524
	Non-specific	[R2]	8	1.40 (1.17)	10	1.40 (.70)	10	2.20 (.79)	*p* = .059
	Pronoun only	[R1]	4	0.90 (1.37)	4	0.50 (0.71)	2	0.20 (0.42)	*p* = .424
Procedure	Specific	[R3]	10	27.60 (9.72)	10	26.40 (9.06)	10	21.30 (10.80)	*p* =.178
	Non-specific	[R2]	9	1.80 (1.03)	8	1.80 (1.55)	8	1.80 (1.23)	*p* = .957
	Pronoun only	[R1]	7	1.20 (1.23)	9	1.30 (0.68)	9	1.80 (1.55)	*p* = .599
Exposition	Specific	[R3]	10	32.30 (17.07)	10	22.20 (7.45)	10	14.90 (4.12)	*p* =.006*
		Post hoc: A v B (*p* = .161); B v C (*p* = .009) ** ; A v C (*p* = .008) **							
	Non-specific	[R2]	10	8.00	10	4.20	10	4.40	*p* = .043*

				(3.83)		(2.04)		(2.22)	
		A v B: p = .033[a] B v C: p = 1.00 A v C: p = .030[a]							
	Pronoun only	[R1]	9	2.40 (1.78)	5	0.70 (0.82)	5	0.90 (1.10)	p =.028*
		Post hoc: A v B (p = .016) **; B v C (p = .775); A v C (p = .036) [a]							
Narrative	Specific	[R3]	10	14.50 (8.75)	10	11.60 (6.48)	10	5.50 (3.028)	p =.018*
		Post hoc: A v B (p = .447); B v C (p = .019) [a]; A v C (p = .015) **							
	Non-specific	[R2]	2	0.30 (.68)	3	0.50 (.85)	0	0 (0)	p = .195
	Pronoun only	[R1]	4	0.40 (0.52)	1	0.10 (0.32)	0	0 (0)	p = .049*
		Post hoc: A v B (p = .131); B v C (p = .317); A v C (p = .029) [a]							

*Significant at α = .05
** Significant at bonferroni corrected α= .017
[a]Not significant as a bonferroni adjusted alpha level of .017 has been used for the post hoc tests to avoid increasing the risk of a type one error.

Table 7. Number and proportion of conjunctions used by participants in each genre (topics combined in everyday genre)

Type of conjunction	Conjunction used	Recount	Procedure	Exposition	Narrative
		No. (proportion) (n = 30)	No. (proportion) (n = 30)	No. (proportion) (n = 30)	No. (proportion) (n = 30)
Adversative	[AC:BAR]	-	-	-	1 (0.03)
	[AC: BUT]	19 (0.63)	24 (0.77)	29 (0.97)	24 (0.80)
	[AC: EXCEPT]	-	-	-	1 (0.03)
	[AC: HOWEVER]	1 (0.03)	-	1 (0.03)	1 (0.03)
	[AC: OR]	-	1 (0.03)	-	2 (0.07)
	[AC:RATHERTHAN]	-	-	1 (0.03)	-
	[AC:THENAGAIN]	-	-	1 (0.03)	-
	[AC:WHEREAS]	-	-	1 (0.03)	-
	Total	20 (X=6.6)	25 (X=8.3)	33 (X=11)	29
Causal	[CC:AS]	1 (0.03)	-	-	-
	[CC: BECAUSE]	13 (0.43)	17 (0.57)	26 (0.87)	16 (0.53)
	[CC: SO]	23 (0.77)	25 (0.83)	28 (0.93)	22 (0.73)
	[CC: WHY]	-	-	2 (0.07)	-
	Total	37 (X=12.3)	42 (X=14)	56 (X=18.6)	38
Conditional/ consequential	[CONDC:HENCE]	-	-	1 (0.03)	-
	[CONDC: IF]	3 (0.10)	26 (0.87)	18 (0.60)	4 (0.13)
	[CONDC:OTHERWISE]	-	-	-	1 (0.03)
	[CONDC: THEREFORE]	-	1 (0.03)	2 (0.07)	-
	[CONDC: WHICH]	1 (0.03)	1 (0.03)	1 (0.03)	-
	[CONDC: UNLESS]	1 (0.03)	-	-	-
	[CONDC: WHEREAS]	-	1 (0.03)	-	-
	[CONDC:WHETHER]	-	1 (0.03)	-	-

	Total	5 (X=1.6)	30 (X=10)	21 (X=7)	5
Temporal	[TC:AGAIN]	-	-	2 (0.07)	-
	[TC:ALWAYS]	-	-	1 (0.03)	-
	[TC:ANDTHEN]	24 (0.80)	30 (1.0)	2 (0.07)	13 (0.43)
	[TC:AND]	3 (0.10)	4 (0.13)	4 (0.13)	1 (0.03)
	[TC: BEFORE]	1 (0.03)	2 (0.07)	2 (0.07)	2 (0.07)
	[TC: FIRST]	-	3 (0.10)	-	-
	[TC:NOW]	-	-	1 (0.03)	-
	[TC: SOTHEN]	-	1 (0.03)	-	-
	[TC:THEN]	8 (0.27)	24 (0.80)	10 (0.33)	13 (0.43)
	[TC: UNTIL]	-	3 (0.10)	4 (0.13)	1 (0.03)
	[TC:WHEN]	8 (0.27)	4 (0.13)	5 (0.17)	6 (0.20)
	[TC: WHILE]	1 (0.03)	5 (0.17)	-	3 (0.10)
	[TC:WHILST]	1 (0.03)	-	-	-
	Total	46 (X=15.3)	76 (X=25.3)	31 (X=10.3)	39